

Mother Earth's Age--Government Sends Committee of Learned Scientists to Investigate--Passed Its Youth

BY JOHN ELFRETH WATKINS.

"How old are you, madam?" Silence on the part of the woman--the same old impenetrable, sphinx-like silence.

While the census man has been enacting this little scene with thousands of her American daughters, a learned committee of government savants have been repeating it with old Mother Earth herself, but, unhappily, they have not had the law on their side to make the old dame answer up or go to jail. Instead, they have had to gauge her years by examining a new time-worn tooth, by measuring the depth of her wrinkles, by analyzing the fluid of her arteries. Thus they have revised all previous estimates of her span of life.

They say that she is about twice as old as Lord Kelvin found her when he last looked her over, a baker's dozen of years ago, but not nearly so aged as the great Darwin thought her.

"Not above 70,000,000 nor below 55,000,000 years," is their verdict, and how are you going to contradict them? They are two of the government's most learned scientists--Professor Frank Wigglesworth Clarke, chief chemist of the United States Geological Survey, and Dr. George F. Becker, geologist, of the same institution. Both are men of international reputation, Professor Clarke being a chevalier of the Legion of Honor, a medalist and member of learned societies abroad, and Dr. Becker a Ph. D. of Heidelberg, who has toured the world, examining the diamond fields of South Africa, hiking with our soldiers in the tropical jungles to study the mineral resources of the Philippines, and viewing Mother Earth from every quarter of the compass.

What the Old Theologians Found. The old theologians told man that his planet was 6,000 years old, and they reckoned it from the lives of the patriarchs. Look in your Bible to-day and you will probably find the creation of the world dated at 4,300 B. C., this on the authority of the Roman abbot, Dennis the Less, or of James Usher, the Anglican archbishop.

But these scientists say that our footstool is 10,000 times as old as the theologians taught--that earth became earth some 30,000 times as far back as the time of Jesus of Nazareth. But how do they estimate it?

There have been many methods used in the past for solving the vexed problem. I once read that theological literature preserves 132 different schemes for estimating the age of the earth at the time of the birth of Jesus. Doubtless there have been many more methods devised by scientists, since a generation ago, when they began to burn the midnight oil over the matter, and to weave seeds of doubt in the minds of the good people who implicitly believed that the deluge took place 2,000 years after the creation, and that Christ was born 2,000 years after the deluge.

How they did it. Now this is the method by which Clarke and Becker make their new calculation: They estimate the rate at which the earth's surface matter is being worn away by rain, rivers, frost, ice and winds, and with this factor figure out how long it has taken those elements to leave our globe in its present condition. Some years ago Sir Archibald Geikie calculated that at their present rate of wearing away from the natural agencies the British Isles would be leveled down to the surface of the sea in about 550,000,000 years, and by a reversal of his process the American scientists come to their conclusions.

Professor Clarke estimates that about 2,000,000,000 tons of the surface matter of the entire earth is being worn per annum. Europe shows the greatest wearing, each year a hundred tons per square mile, and Asia ranks second with eighty-four tons. Then comes North America, losing seventy-nine tons; South America, losing fifty-nine tons; and finally, Africa, losing fifty-ton tons.

Our continent, North America, is being worn away at the rate of 474,000,000 tons per year. He also estimates that the rivers of the world are annually washing 2,735,000,000 tons of salty matter into the ocean. Other scientists have attempted to estimate the age of the ocean by dividing the total salty matter by the amount annually carried into it by rivers, but Professor Clarke corrects their figures by taking certain other processes into consideration. In the first place he estimates the amount of the salt that is being blown inland by a reversal of his again into the ocean and pastures being retained by the soil. He also goes so far as to account for the amount of salt washed into the ocean in the sewage of cities, the refuse of chemical manufactures, etc.--over 13,000,000 tons a year, estimated in terms of common salt.

A Bridge of Salt to the Moon. A total amount of salty matter in the ocean, he says, would, if concentrated, measure 4,800,000 cubic miles. In other words, you could manufacture out of ocean water enough of this salty matter to build a bridge to the moon one mile wide by twenty miles high. If you set these big cubes in rows they would form about the equator a band one mile high and 230 miles wide! Another step is to estimate the total amount of rock in the earth's crust, which has been estimated to thus salt the ocean, and another is to figure out the time required to wash the nettle accumulation into the ocean.

Our land surface is wearing down at the rate of 1 foot in 24,000 years, he finds, while Europe suffers the same damage in 18,000 years, and South America an equal amount in 37,500 years. The average rate at which the earth's land area as a whole is being leveled off he calculates as 1 foot in 27,660 years.

Testimony of a Mollusk. Dr. Becker in his part of the calculation measures earth's age both by the rate at which sodium has accumulated in the ocean and by the rate of the earth's cooling. He assumes the earth to have been half of its present age at the time of the dawn of what geologists call the Cambrian period. Inasmuch as these deposits contain fossils of some little mollusks still found in the ocean to-day--notably the bivalve-like "tongue shells"--he believes that back in those ages sea water was practically the same as it is to-day, and he thinks it probable that any now-fallen continents ever bridged the present ocean bottoms. He also disagrees with the scientists of to-day who believe a great part of the heat emitted by the earth is due to radium and such radioactive bodies. Less than a tenth issues from that source, in his opinion, nine-tenths being due to compression of the earth's crust. And, finally, on the basis of his calculations and Professor Clarke's, the final verdict is that Mother Earth must own up to between 55,000,000 and 70,000,000 years, if she ever speaks the truth.

Lord Kelvin Surrendered to Yankees. This estimate agrees very nearly with that of Dr. Charles D. Walcott, the secretary of the Smithsonian who had already calculated that the earth is not over 70,000,000 years old. His data were collected during the time he was connected with the United States Geological Survey, and it is notable that in this institution were made researches which led to the estimate of the world's age, which has interested scientists more than any other calculation of the past generation--Lord Kelvin's.

This great physicist, by working out the rule that the thickness of the earth's solid crust increases as the square root of the earth's age, concluded back in Civil War times that our spinning top was anywhere from twenty to four hundred million years old. But some time ago, in a laboratory of the United States Geological Survey, two members of that bureau's staff, Clarence King and Carl Barua, made some surprising discoveries concerning the melting point of rocks which led Lord Kelvin to revise his estimate of the earth's age.

"We now have good reason," he opined, "that it was more than twenty and less than forty million years, and probably much nearer twenty than forty." Thus, the greatest physicist of his time came to America to get the final data for his most famous contribution to science.

Halley's and Darwin's Opinions. Back in the old days when the scientists and theologians vied with one another in attempts to harmonize the Moslem evidences of the earth's age with the testimony of nature, Sir Edmund Halley, the same genius who discovered our recent celestial visitor, devised a method of determining the age of the ocean from the amount of



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salt which it contains. Although predicting that by this method "the world may be found much more than many have hitherto imagined," he did not attempt to answer the sphinx riddle himself.

Darwin, the same who surprised us with our near kinship with the apes, thought an estimate of 300,000,000 years for old earth's age too small. He traced the footprints of time upon the north and south downs of England over 303,000,000 years, and Sir Charles Lyell thought that 240,000,000 years was the time required by all of the species to have changed to their present forms.

Preacher's Unorthodox Theory. Then came the Rev. Samuel Houghton, a British geologist and divine of Trinity College, Dublin, ignoring the theories of his brother theologians to the extent of pronouncing that earth had been habitable for a time "as great as to be inconceivable by beings of our limited intelligence." And it is of interest to glance at the calculations of some of the latter scientists. Dr. James Croft back in the eighties, for example, dated plant and animal life to a period "infinitely more remote" than 10,000,000 years and maybe 100,000,000, while Sir Archibald Geikie figured our planet's age at between 100,000,000 and 600,000,000 years. And next came a geologist, Millard Read, with the calculation that time has been wearing down our mountains, hills and fields at the rate of one foot per 3,000 years, since the world began. He had fixed old earth's years at something over 95,000,000 when our own great scientist, Professor J. D. Dana, jump-

ed into the fray with a calculation of something over 48,000,000. "You don't suppose geological history has run through a billion years?" Lord Kelvin once asked Sir Allan Ramsay, the geologist.

"Certainly, I do," answered Sir Allen. "Ten billion years?" "Yes," replied the knight again. "Mystery and Miracle of Creation?" "Mother earth's favor should be on the side of the physicists, for in these repeated discussions with the naturalists they have usually contended that she is much younger than the naturalists will admit. And until now, when Professor Clarke and Dr. Becker practically reaffirm the estimate of Secretary Walcott, there has always been such a wide disagreement of doctors as we have seen above. As Dr. Walcott himself puts it, the only conclusion that can be drawn from these older estimates as a whole is that the earth is very old and that man's occupation of it is but a day's span as compared with the eons that have elapsed since the first consolidation of the rocks with which the geologist is acquainted."

Each measures the way back to the beginning, and then--what? The bounding precipice is so steep that none of them dares creep to the edge and look down. Lord Kelvin took half a glance, but returned to tell only what was not there. Speaking of the "commencement of life," he said: "This certainly did not take place by any action of chemistry or electricity, or by any grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause here to face with the mystery and miracle of the creation of living creatures." (Copyright, 1910, by John Elfreth Watkins.)

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of the scores made by the women were highly creditable. The prize for the highest among the married women was won by Mrs. J. S. Perry, of Roanoke, and that for the young women by Miss Sproule, of New Orleans.

The lobby of the hotel was the scene of a subscription bridge party Tuesday morning, in which the first prize was won by Mrs. Charles Warren, of Bacon's Castle; the second by Mrs. Thomas N. Jones, of Smithfield, and the consolation by Mrs. Sproule, of New Orleans.

On Sunday evening Rev. W. D. Moss, pastor of the Washington Heights Presbyterian Church, Washington, D. C., preached an excellent sermon that was heard with close attention by nearly all the guests.

MANY PLEASURES OFFERED TO GUESTS

Delightful German on Thursday Evening--Parties for the Young People.

[Special to The Times-Dispatch.] Sweet Chalybeate, Va., September 3.--Numerous summer diversions entertained the gay throng assembled at the Sweet Chalybeate during the past week. At the German danced on Thursday evening, the women, in beautiful costumes, moving through the intricate figures, made a kaleidoscope scene of rainbow coloring that was ideal. Dancing with the leader, Colonel W. W. Old, of Norfolk, was Miss Charlotte Pleasants, of Wilmington, N. C. The chaperons who graced the occasion were Mrs. W. W. Old, Mrs. J. W. Montague, Mrs. W. A. Godwin, Mrs. T. A. Jones and Mrs. R. F. Baldwin, Norfolk; Mrs. Blair Burwell, Mrs. Lawrence Haynes, Mrs. L. Z. Baya and Mrs. T. B. Livingston, of Jacksonville, Fla.; Mrs. T. F. Schley, Lynchburg; Mrs. Stuart Baldwin, Chicago; Mrs. John Moody, Atlanta, Ga.; Mrs. L. B. Blackmer, Rochester, N. Y.; Mrs. David Rice, Mrs. B. B. Rice, Mrs. T. A. Gargill and Mrs. J. W. Evans, Houston, Texas; Mrs. Thomas A. Barker, Louisville, Ky.; Mrs. Louis LeSassier, New Orleans, La.; Mrs. J. I. Barnham, Washington, D. C.; Mrs. W. A. Boykin, Baltimore, Md.; Mrs. A. W. Maupin and Mrs. G. Hutton, Portsmouth, Va.

Among the most pleasant events of the season was a marshmallow roast given on Chestnut Hill by Joseph Budd, of Atlanta, Ga. Those invited were Misses Libbie Rice, Houston, Texas; Marie Burwell, Jacksonville, Fla.; Sue Pretlow, Franklin; Helen Phillips, Washington, D. C.; Christine Rogers, Aberdeen, Miss.; Mary Helen Moody, Atlanta, Ga.; Brown Rice, Houston, Texas; Brad Tazewell, Norfolk; M. Lloyd and E. Brook Eakle.

Little Kitty Baldwin, of Norfolk, entertained her friends on her fifth birthday, and another occasion of joy to the children was a party given them on the lawn by the Misses Helen and Charlotte Pleasants, of Wilmington, N. C.

Mrs. L. B. Blackmer, of Rochester, N. Y., gave a farewell entertainment to a number of her friends, and Miss Bettie Poindexter, of Norfolk, also gave a tea.

Mrs. Bernard Smith and T. A. Jones, of Norfolk, delightfully entertained at bridge.

Bishop Tucker and Rev. G. F. Rogers, while here, held services in the Douglas Memorial Chapel, within the grounds.

G. Hutton, of Portsmouth, and R. T. Arlington, of Richmond, have invited their families, who have been spending the summer here.

Mrs. E. C. Means, Mrs. S. E. Ringo, Miss Harriet Means, Kendal Gordon Seaton and D. B. Ringo are here from Low Moor, Va., to enjoy the festivities of the week.

Mrs. S. E. Yonge, Miss Catherine Yonge, of Richmond; Mrs. Arthur Vaughan, Miss Martha Vaughan and Master Arthur Vaughan, Jr., of Chicago; C. D. Wingfield, of Richmond; C. D. Tazewell, of Norfolk; Miss Frances Bailey, Wilmington, N. C., and W. S. Sisk, of Columbia, S. C., have arrived to enjoy September in the mountains.

KAPPA ALPHA DANCE AT ALLEGHANY INN

Enjoyable Affair Followed by Banquet, at Which Thirty Couples Are Present--Richmond Arrivals.

[Special to The Times-Dispatch.] Goshal, Va., September 3.--Among the recent Richmond arrivals at the Allegany Inn, Goshen, are:

I. Schreiner, A. A. Cannon and wife, W. W. La Prade, Mason White, Dr. J. R. Gilderale, A. J. Goddin, Miss Rosa Tiant, John L. Smith, Miss Julia Row, E. L. Smith and Mr. Arthur Cannon. Miss Mary Waddell, Mr. and Mrs. G. H. Clark, F. B. Isaacs, J. W. Gillman, E. J. Gillman, Mrs. E. R. Fuller, Isabel Fuller, Henry Fuller, M. P. Watkins, A. W. Goddin.

The room of the hotel enjoyed a delightful dancing party last Saturday evening. The ballroom was decorated with pennants of various colleges, while at the head of the room was the emblem of the Kappa Alpha Society, illumined with red and blue lights. One of the pretty features was a German figure, the Kappa Alpha, led by Robert Burke, of Staunton, and Miss Eleanor Donaghy, of New York City.

After the dancing was over a banquet was given in the beautiful hotel dining room by J. W. Rowland, Plates were laid for thirty couples. Mr. Rowland was toastmaster, and called upon a number of guests present, who responded cleverly. A number of Kappa Alpha men came down from Washington, men from the V. M. I.; also a number from Staunton were present.

Several very delightful bridge parties have been given during the past week, one of the most charming being that on Monday evening by Miss Betty Clarke, of Lexington.

A lawn party was given Tuesday afternoon, which was greatly enjoyed by the children of the hotel. The party was for the next couple of weeks, and the house will be filled with a good, congenial company until the last of the month or longer.

SOCIETY AND SPORT AT TATE SPRING, TENN.

Many Guests Enjoy Beautiful Autumn Days--Horseback Riding Popular.

[Special to The Times-Dispatch.] Tate Spring, Tenn., September 3.--Eastern Tennessee is never more beautiful than in September. The first approach of autumn tinges the mountains in gold. The horseback rider delights in the picturesque roads; the golfer pauses to enjoy the landscape of field and woodland and mountain.

There is still a large crowd of health and pleasure seekers at the hotel and cottages. Mrs. LeRoy Percy, wife of the United States Senator from Mississippi, and Mrs. Frank H. Crocker, wife of the manager of the United States Steel Corporation at Birmingham,



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ham, have been prominent in the social functions of the week.

Mrs. L. M. Kilby, of Birmingham, one of the most beautiful women here, is a graceful horseback rider and an expert golfer.

Mr. and Mrs. Frank Mebane, of North Carolina, who have been spending the week at the Brunswick Inn, have been the recipients of many social attentions.

Miss Janet Barton, of Danville, Ill., is the guest of Mr. and Mrs. A. B. Anderson, at their cottage home.

Miss Jennie Mobley, of Atlanta, is the guest of Dr. and Mrs. Tomlinson, at their country home.

The winner of the ladies' cup, donated by J. Alwyn Hall, of Charleston, in the two ball games tournament this week, was Miss Mary Wright, of Pemberton, Va. J. D. Fulmer, of Memphis, being her partner.

The vice-president of the Seaboard, Charles R. Capps, with his golf clubs, arrived here to-day from Portsmouth, Va., for a two weeks' outing.

Dr. J. Pettigrew, United States Marine surgeon, stationed at New Orleans, arrived to-day.

On the golf links are noted this week: William Morrell, Jos. Hull, of Savannah, Ga.; T. R. Gordon, Louisville; T. M. Roward, Vicksburg; J. E. Hickcy, Montgomery, Ala.; Judge M. M. Al-

lison, Chattanooga, Tenn.; O. W. Hull, New York City.

GAYEST WEEK OF SEASON AT THE BRUNSWICK INN

Numerous Dances and Card Parties Enjoyed by Guests.

[Special to The Times-Dispatch.] Waynesboro, Va., September 3.--This past week has been by far the most popular and gayest one at the Brunswick Inn this summer. Dances and card parties have been numerous.

Last week, on Thursday, a large dance was enjoyed by the guests and the young people of Waynesboro.

On Friday a camping party of twenty young boys and girls were entertained by Mr. and Mrs. Hadra, who have been recent guests at the Inn. After supper an informal dance was given for them.

The usual week-end dance was enjoyed Saturday night. Mr. and Mrs. Richards Mr. Swink, of Richmond, and Miss McKee toured to Natural Bridge on Sunday, returning to the inn Monday evening.

Many of the week-end guests remained over, visiting at the inn and nearby cottages, for a large dance given Tuesday night.

All of the girls and boys staying here gave a beautiful supper party on Wednesday night, as a farewell to a few of their friends.

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